

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

1.96
R31Fsmo
Cop. 2



U. S. DEPT. OF AGRICULTURE
NATIONAL AGRICULTURAL LIBRARY

JUN 17 1970

CURRENT SERIAL RECORDS

WATER SUPPLY OUTLOOK FOR MONTANA

and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

UNITED STATES DEPARTMENT of AGRICULTURE...SOIL CONSERVATION SERVICE,

and
MONTANA AGRICULTURAL EXPERIMENT STATION

Data included in this report were obtained by the agencies named above in cooperation with Federal, State, and private organizations listed on the inside back cover of this report.

AS OF
JUNE 1, 1970

TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season will interact with a resultant average effect on runoff. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1400 snow courses in Western United States and in the Columbia Basin in British Columbia. In the near future, it is anticipated that automatic snow water equivalent sensing devices along with radio telemetry will provide a continuous record of snow water equivalent at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

PUBLISHED BY SOIL CONSERVATION SERVICE

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, Western Regional Technical Service Center, Room 209, 701 N. W. Glisan, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

| STATE | ADDRESS |
|--------------------|---|
| Alaska | P. O. Box "F", Palmer, Alaska 99645 |
| Arizona | 6029 Federal Building, Phoenix, Arizona 85025 |
| Colorado (N. Mex.) | 12417 Federal Building, Denver, Colorado 80202 |
| Idaho | Room 345, 304 N. 8th. St., Boise, Idaho 83702 |
| Montana | P. O. Box 98, Bozeman, Montana 59715 |
| Nevada | P. O. Box 4850, Reno Nevada 89505 |
| Oregon | 1218 S. W. Washington St., Portland, Oregon 97205 |
| Utah | 4012 Federal Building, Salt Lake City, Utah 84111 |
| Washington | 360 U.S. Court House, Spokane, Washington 99201 |
| Wyoming | P. O. Box 340, Casper, Wyoming 82601 |

PUBLISHED BY OTHER AGENCIES .

Water Supply Outlook reports prepared by other agencies include a report for California by the Water Supply Forecast and Snow Surveys Unit, California Department of Water Resources, P. O. Box 388, Sacramento, California 95802 --- and for British Columbia by the Department of Lands, Forests and Water Resources, Water Resources Service, Parliament Building, Victoria, British Columbia



WATER SUPPLY OUTLOOK FOR MONTANA

and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

Issued by

KENNETH E. GRANT

ADMINISTRATOR
SOIL CONSERVATION SERVICE
WASHINGTON, D.C.

|||||

Released by

A. B. LINFORD

STATE CONSERVATIONIST
SOIL CONSERVATION SERVICE
Bozeman, Montana

In Cooperation with

J. A. ASLESON

DIRECTOR
Montana Agricultural Experiment Station

|||||

Report prepared by

P. E. FARNES, Snow Survey Supervisor

SOIL CONSERVATION SERVICE
P.O. Box 98
Bozeman, Montana 59715



TABLE OF CONTENTS

| | <u>Page</u> |
|--|-------------------|
| WATER SUPPLY OUTLOOK | 1 |
| SOIL MOISTURE | 2 |
| RESERVOIR STORAGE | 3 |
| SNOW | 4-7 |
| SUPPLEMENTAL MEASUREMENTS AND CORRECTIONS | 8-10 |
| SNOW PILLOW DATA | |
| Kootenai | |
| Poorman Creek and Banfield Mountain | 11 |
| Hawkins Lake and Garver Creek | 12 |
| Columbia | |
| Black Pine and Hoodoo Basin | 13 |
| Twin Lakes, Saddle Mountain and Twelvemile Creek . . . | 14 |
| Missouri | |
| Madison Plateau, Lion Mountain and West Yellowstone . | 15 |
| Bridger Bowl, Bangtail and Maynard Creek | 16 |
| Shower Falls, Carrot Basin and Lick Creek | 17 |
| Spur Park and Deadman Creek | 18 |
| Rocker Peak and Rocky Boy | 19 |
| Mount Lockhart and Waldron | 20 |
| Fisher Creek and Northeast Entrance | 21 |
| MAP OF SNOW COURSES AND SOIL MOISTURE STATIONS | |
| COOPERATORS | Inside Back Cover |



MONTANA WATER SUPPLY OUTLOOK

June 1, 1970

In general, the mountain snow pack continues to be above average east of the divide, and near or above average west of the divide.

Based on telemetry and snow pillow records it appears the peak flows of the Yellowstone River will occur between June 21-30. The Missouri headwaters should peak between June 14-20. Streams in the Clark Fork headwaters west of the divide reached their peak the end of May.

Flathead River drainage snow pillow records are insufficient to determine timing of peak flows.

Supplemental measurements and corrections to previously published data are included in this final 1970 season report.

*
* What amount can Montana afford to keep its water clean? *
* *

THE HISTORY OF THE CITY OF BOSTON

From its first settlement in 1630 to the present time. By
JOHN G. REVERE, Esq. of the City of Boston.
In two volumes. The first volume contains the history
from 1630 to 1780. The second volume contains the
history from 1780 to the present time. The first volume
contains the history of the city from its first settlement
in 1630 to 1780. The second volume contains the
history of the city from 1780 to the present time.
The first volume contains the history of the city from
its first settlement in 1630 to 1780. The second
volume contains the history of the city from 1780
to the present time. The first volume contains the
history of the city from its first settlement in 1630
to 1780. The second volume contains the history of
the city from 1780 to the present time.

SOIL MOISTURE

| DRAINAGE BASIN and/or STATION | | Profile (Inches) | | Date of Survey | Soil Moisture (Inches) | | |
|-------------------------------|-----------|------------------|----------|----------------|------------------------|-----------|-----------|
| Name | Elevation | Depth | Capacity | | This Year | Last Year | Average † |

COLUMBIA RIVER BASIN

Kootenai

| | | | | | | | |
|-------------------|------|----|------|------|------|------|------|
| Baree Trail | 3800 | 48 | 7.5 | 6/02 | 5.3 | - | - |
| Murphy Lake R. S. | 3000 | 48 | 22.6 | 6/01 | 20.0 | 20.0 | 20.8 |
| Raven R. S. | 3050 | 48 | 23.0 | 6/02 | 18.8 | - | - |

Flathead

| | | | | | | | |
|-----------------|------|----|-----|------|-----|-----|-----|
| Desert Mountain | 5600 | 54 | 8.4 | 6/01 | 8.9 | 8.7 | 8.9 |
| Marias Pass | 5250 | 54 | 6.5 | 5/30 | 6.5 | 5.8 | 5.8 |

Clark Fork

| | | | | | | | |
|-------------------|------|----|------|------|------|-----|------|
| Black Pine | 7100 | 48 | 10.0 | 6/03 | 8.7 | 8.6 | 8.6 |
| Seeley Lake R. S. | 4030 | 48 | 11.9 | 6/01 | 11.6 | - | 10.8 |
| Skalkaho Summit | 7260 | 48 | 10.8 | 6/03 | 10.1 | 9.8 | 10.0 |

Bitterroot

| | | | | | | | |
|--------------|------|----|------|------|-----|-----|------|
| Gibbons Pass | 7100 | 48 | 7.1 | 5/28 | 7.4 | 7.0 | 7.0 |
| Lolo Pass | 5250 | 48 | 10.6 | 6/01 | 9.9 | 9.9 | 10.0 |

MISSOURI RIVER BASIN

Beaverhead

| | | | | | | | |
|----------|------|----|------|------|------|------|------|
| Lakeview | 6700 | 48 | 15.3 | 6/01 | 16.7 | 10.2 | 14.3 |
|----------|------|----|------|------|------|------|------|

Madison

| | | | | | | | |
|------------------|------|----|-----|------|-----|-----|---|
| West Yellowstone | 6700 | 48 | 6.5 | 5/28 | 3.7 | 2.8 | - |
|------------------|------|----|-----|------|-----|-----|---|

Gallatin

| | | | | | | | |
|-----------------|------|----|------|------|------|------|------|
| Bridger Bowl | 7250 | 48 | 17.0 | 5/27 | 16.6 | 16.7 | 16.4 |
| College Site | 4856 | 54 | 14.5 | 5/31 | 17.0 | 15.1 | 11.6 |
| Lick Creek | 6860 | 48 | 18.8 | 5/31 | 19.3 | 17.8 | 18.2 |
| Twenty-One Mile | 7150 | 48 | 10.0 | 6/01 | 10.1 | 9.8 | 9.8 |

Missouri Main Stem

| | | | | | | | |
|--------------|------|----|------|------|------|------|------|
| Kings Hill | 7420 | 48 | 11.8 | 6/01 | 10.9 | 11.3 | 10.9 |
| Stemple Pass | 6350 | 48 | 5.9 | 5/28 | 5.5 | 5.2 | 5.2 |

Milk

| | | | | | | | |
|--------------|------|----|------|------|------|---|---|
| Beaver Creek | 3950 | 48 | 20.9 | 6/01 | 14.4 | - | - |
| Rocky Boy | 4700 | 36 | 10.1 | 6/01 | 9.7 | - | - |

Yellowstone

| | | | | | | | |
|--------------------|------|----|------|------|------|------|------|
| Battle Ridge | 6020 | 48 | 17.6 | 5/27 | 15.3 | 15.0 | 15.6 |
| Northeast Entrance | 7350 | 48 | 9.4 | 5/28 | 9.8 | 9.7 | 9.2 |



RESERVOIR STORAGE (Thousand Acre Feet) END OF MONTH

| Basin or Stream | RESERVOIR | Usable Capacity | Usable Storage | | | |
|----------------------|--------------------|--------------------|----------------|-----------|----------|------|
| | | | This Year | Last Year | Average | |
| COLUMBIA RIVER BASIN | | | | | | |
| Flathead | Hungry Horse | 3,428.0 | 2,428.0 | 2,748.0 | 2,632.0 | |
| | Flathead Lake | 1,791.0 | 1,411.0 | 1,469.0 | 1,494.0 | |
| | Camas (4) | 45.2 | | 31.0 | 38.8 | |
| | Mission Valley (8) | 100.3 | | 88.4 | 63.1 | |
| Clark Fork | Georgetown Lake | 31.0 | 27.8 | 26.8 | 24.2 | |
| | Nevada Creek | 12.6 | | - | 11.8 | |
| | Noxon Rapids | 334.6 | 290.8 | - | 220.7 | |
| Bitterroot | Como | 34.9 | 22.6 | 36.4 | 28.1 | |
| | Painted Rocks | 31.7 | 33.4 | 33.3 | 32.6 | |
| MISSOURI RIVER BASIN | | | | | | |
| Beaverhead | Clark Canyon | 328.9 | 167.3 | 158.8 | 127.7 | |
| | Lima | 84.0 | 81.6 | 76.7 | 50.9 | |
| Ruby | Ruby | 38.8 | 38.8 | - | 37.3 | |
| Madison | Hebgen Lake | 377.5 | 331.6 | 351.6 | 278.4 | |
| | Ennis Lake | 41.0 | 33.9 | 37.7 | 35.7 | |
| Gallatin | Middle Creek | 8.0 | 5.3 | 7.8 | 6.7 | |
| Missouri | Canyon Ferry | 2,043.0 | 1,542.0 | 1,847.0 | 1,722.0 | |
| | Hauser & Helena | 61.9 | 59.0 | 60.7 | 57.3 | |
| | Lake Helena | 10.4 | 9.4 | 10.0 | 8.9 | |
| | Holter Lake | 81.9 | 66.4 | 76.7 | 74.8 | |
| | Smith River | 10.7 | | 11.4 | 10.4 | |
| | Durand | 7.0 | | 7.0 | 6.4 | |
| | Martinsdale | 23.1 | | 17.9 | 15.6 | |
| | Deadman's Basin | 72.2 | | 48.7 | 57.2 | |
| | Fort Peck | 19,410.0 | 17,550.0 | 17,270.0 | 11,570.0 | |
| | Gibson | 105.0 | 90.4 | 104.4 | 94.7 | |
| Sun | Willow Creek | 32.3 | 31.1 | 29.9 | 27.6 | |
| | Pishkun | 32.0 | 31.7 | 26.1 | 28.1 | |
| | Marias | Lower Two Medicine | 16.6 | 12.4 | 13.7 | 9.5 |
| | | Four Horns | 19.2 | 12.5 | 12.4 | 12.9 |
| Swift | | 30.0 | 30.3 | 30.1 | 28.3 | |
| Lake Frances | | 112.0 | 101.2 | 92.7 | 98.2 | |
| Milk | Tiber | 1,347.0 | | 598.7 | 742.0 | |
| | Fresno | 127.2 | 123.8 | 99.4 | 109.5 | |
| | Nelson | 66.8 | 56.8 | 53.0 | 46.9 | |
| | Lake Sherburne | 66.1 | | 55.3 | 28.3 | |
| Yellowstone | Mystic Lake | 20.8 | 6.0 | 8.9 | 6.3 | |
| | Tongue River | 68.0 | 46.2 | 59.5 | 35.5 | |
| | Cooney | 27.5 | | 19.3 | 16.5 | |
| Big Horn | Yellowtail | 1,356.0 | 999.4 | 886.8 | - | |



SNOW

| DRAINAGE BASIN and/or SNOW COURSE | | THIS YEAR | | | PAST RECORD | |
|-----------------------------------|-----------|----------------|---------------------|------------------------|------------------------|---------|
| | | Date of Survey | Snow Depth (Inches) | Water Content (Inches) | Water Content (inches) | |
| NAME | Elevation | | | | Last Year | Average |

COLUMBIA RIVER BASIN

KOOTENAI RIVER

| | | | | | | |
|--------------------------|------|------|----|------|------|------|
| Bald Eagle Peak | 5700 | 5/25 | 85 | 45.1 | 31.3 | - |
| Banfield Mountain | 5600 | 5/27 | 14 | 7.4 | 0.0 | - |
| Banfield Mountain Pillow | 5600 | 5/27 | SP | 5.3 | 0.0 | - |
| Bristow Creek | 3900 | 5/27 | 0 | 0.0 | 0.0 | - |
| Cedar Grove | 4100 | 5/25 | 0 | 0.0 | 0.0 | - |
| Davis Creek | 5400 | 5/26 | 0 | 0.0 | 0.0 | - |
| Garver Creek | 4250 | 5/26 | 0 | 0.0 | 0.0 | - |
| Garver Creek Pillow | 4250 | 5/26 | SP | 0.0 | 0.0 | - |
| Glacier | 4100 | 5/26 | 22 | 11.1 | 6.3 | 11.2 |
| Graves Creek | 4300 | 5/28 | 0 | 0.0 | 0.0 | 0.8 |
| Gray Creek | 5100 | 5/29 | 0 | 0.0 | - | 11.3 |
| Hawkins Lake | 6450 | 5/26 | 36 | 17.0 | 13.5 | - |
| Hawkins Lake Pillow | 6450 | 5/26 | SP | 18.1 | 18.3 | - |
| Kicking Horse | 5400 | 6/01 | 0 | 0.0 | - | - |
| Lost Soul | 4800 | 5/27 | 0 | 0.0 | 0.0 | - |
| Marble Canyon | 5000 | 5/29 | 0 | 0.0 | - | 1.0 |
| Morrissey Ridge | 6100 | | | | - | 13.0 |
| Poorman Creek | 5100 | 5/25 | 26 | 12.9 | 0.0 | - |
| Poorman Creek Pillow | 5100 | 5/25 | SP | 4.0 | 0.1 | - |
| Red Mountain | 6000 | 5/27 | 10 | 5.2 | 0.0 | 5.6 |
| Stahl Peak | 6050 | 5/28 | 49 | 26.9 | 16.8 | - |
| Weasel Divide | 5450 | 5/28 | 28 | 14.4 | 3.6 | 19.7 |

SP - Snow pillow observation - water content only.



SNOW

| DRAINAGE BASIN and/or SNOW COURSE | | THIS YEAR | | | PAST RECORD | |
|-----------------------------------|-----------|----------------|---------------------|------------------------|------------------------|---------|
| | | Date of Survey | Snow Depth (Inches) | Water Content (Inches) | Water Content (inches) | |
| NAME | Elevation | | | | Last Year | Average |

FLATHEAD RIVER

| | | | | | | |
|---------------------|------|------|----|------|------|------|
| Big Creek | 6750 | 6/01 | 91 | 47.4 | 28.2 | 42.7 |
| Desert Mountain | 5600 | 6/01 | 0 | 0.0 | 0.0 | 0.7 |
| Fatty Creek | 5500 | 6/01 | 25 | 12.8 | 0.0 | 7.2 |
| Hell Roaring Divide | 5770 | 6/01 | 0 | 0.0 | 3.1 | 13.5 |
| North Fork Jocko | 6330 | 6/02 | 63 | 34.2 | 9.4 | 30.7 |

CLARK FORK RIVER

| | | | | | | |
|---------------------|------|------|----|------|------|------|
| Black Pine | 7100 | 6/03 | 0 | 0.0 | 0.0 | 4.1 |
| Black Pine Pillow | 7100 | 6/03 | SP | 1.9 | 0.0 | 5.0 |
| Heart Lake Trail | 4800 | 5/28 | 7 | 3.0 | 0.0 | - |
| Hoodoo Basin | 6000 | 5/28 | 76 | 37.8 | 24.9 | - |
| Hoodoo Basin Pillow | 6000 | 5/28 | SP | 34.4 | - | - |
| Hoodoo Creek | 5900 | 5/28 | 74 | 36.5 | 24.6 | 32.0 |
| Intergaard | 6450 | 6/01 | 0 | 0.0 | - | - |
| Lookout | 5250 | 6/01 | 42 | 20.7 | 16.6 | 13.9 |
| Skalkaho Summit | 7260 | 6/03 | 33 | 16.4 | 0.0 | 16.8 |
| Stuart Mountain | 7400 | 6/01 | 54 | 26.0 | - | 18.0 |
| TV Mountain | 6800 | 6/01 | 32 | 13.8 | - | - |

BITTERROOT RIVER

| | | | | | | |
|-------------------------|------|------|----|------|------|------|
| Gibbons Pass | 7100 | 5/29 | 30 | 14.9 | 0.9 | 7.6 |
| Lost Horse | 5940 | 5/30 | 57 | 26.8 | 10.2 | 18.5 |
| Saddle Mountain | 7940 | 5/29 | 51 | 24.5 | 13.6 | 18.0 |
| Saddle Mountain Pillow | 7940 | 5/29 | SP | 26.8 | 10.8 | - |
| Twelvemile Creek | 5600 | 5/30 | 0 | 0.0 | 0.0 | - |
| Twelvemile Creek Pillow | 5600 | 5/30 | SP | 0.0 | 0.0 | - |
| Twin Lakes | 6510 | 5/30 | 74 | 36.6 | 15.6 | 32.2 |
| Twin Lakes Pillow | 6510 | 5/30 | SP | 34.1 | 12.8 | - |

SP - Snow pillow observation - water content only.



SNOW

| DRAINAGE BASIN and/or SNOW COURSE | | THIS YEAR | | | PAST RECORD | |
|-----------------------------------|-----------|----------------|---------------------|------------------------|------------------------|---------|
| | | Date of Survey | Snow Depth (Inches) | Water Content (Inches) | Water Content (inches) | |
| NAME | Elevation | | | | Last Year | Average |

MISSOURI RIVER BASIN

RUBY RIVER

| | | | | | | |
|-------------------|------|------|----|------|---|---|
| Branham Lakes | 8850 | 6/01 | 76 | 38.4 | - | - |
| Middle Mill Creek | 7850 | 6/01 | 26 | 12.4 | - | - |
| Smuggler Mine | 6960 | 6/01 | 0 | 0.0 | - | - |

JEFFERSON RIVER

| | | | | | | |
|--------------------|------|------|----|------|-----|---|
| Copper Mountain | 7700 | 6/01 | 0 | 0.0 | 0.0 | - |
| Rocker Peak | 8000 | 6/01 | 31 | 12.9 | 0.0 | - |
| Rocker Peak Pillow | 8000 | 6/01 | SP | 18.0 | 7.7 | - |
| Uncle Sam Gulch | 6500 | 6/01 | 0 | 0.0 | 0.0 | - |

MADISON RIVER

| | | | | | | |
|-------------------------|------|------|----|------|-----|---|
| Madison Plateau | 7750 | 5/28 | 29 | 14.3 | - | - |
| Madison Plateau Pillow | 7750 | 5/28 | SP | 14.7 | 1.2 | - |
| West Yellowstone Pillow | 6700 | 5/28 | SP | 0.0 | 0.0 | - |

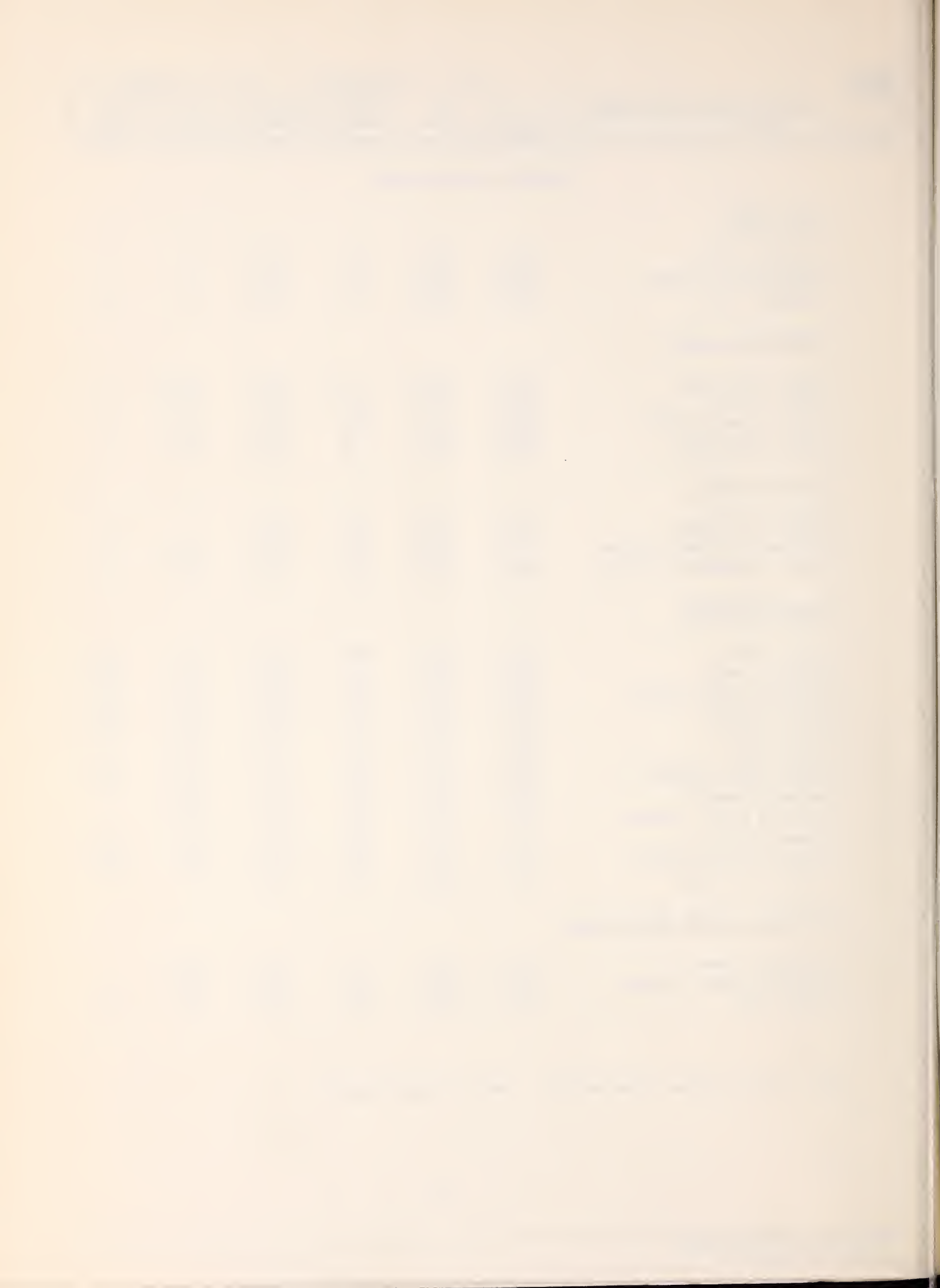
GALLATIN RIVER

| | | | | | | |
|----------------------|------|------|----|------|------|------|
| Arch Falls | 7350 | 5/27 | 40 | 16.8 | 0.3 | 8.9 |
| Bridger Bowl | 7250 | 5/27 | 70 | 34.4 | 1.6 | 20.8 |
| Bridger Bowl Pillow | 7250 | 5/27 | SP | 35.4 | 0.0 | 15.3 |
| Devils Slide | 8100 | 5/27 | 75 | 34.4 | 11.6 | 23.0 |
| Hood Meadow | 6600 | 5/27 | 16 | 5.8 | 0.0 | 1.5 |
| Lick Creek | 6860 | 5/27 | 13 | 4.9 | 0.0 | 0.0 |
| Lick Creek Pillow | 6860 | 5/27 | SP | 4.7 | 0.0 | 0.0 |
| Maynard Creek | 6210 | 5/27 | 26 | 13.5 | 0.0 | - |
| Maynard Creek Pillow | 6210 | 5/27 | SP | 15.6 | 0.0 | - |
| Shower Falls | 8100 | 5/27 | 83 | 39.3 | 11.5 | 25.6 |
| Shower Falls Pillow | 8100 | 5/27 | SP | 37.0 | 10.1 | 22.2 |
| Twenty-One Mile | 7150 | 5/28 | 8 | 3.7 | - | - |

MISSOURI RIVER (Main Stem)

| | | | | | | |
|----------------------|------|------|----|------|-----|------|
| Deadman Creek | 6450 | 6/01 | 0 | 0.0 | 0.0 | - |
| Deadman Creek Pillow | 6450 | 6/01 | SP | 0.0 | 0.0 | - |
| Kings Hill | 7500 | 6/01 | 41 | 18.6 | 0.0 | 10.3 |

SP - Snow pillow observation - water content only.



SNOW

| DRAINAGE BASIN and/or SNOW COURSE | | THIS YEAR | | | PAST RECORD | |
|-----------------------------------|-----------|----------------|---------------------|------------------------|------------------------|---------|
| | | Date of Survey | Snow Depth (Inches) | Water Content (Inches) | Water Content (inches) | |
| NAME | Elevation | | | | Last Year | Average |

JUDITH RIVER

| | | | | | | |
|------------------|------|------|----|------|-----|------|
| Avalanche | 7100 | 6/01 | 88 | 41.2 | - | - |
| Crystal Lake | 6100 | 6/01 | 36 | 15.1 | - | - |
| Rock Creek | 5600 | 6/01 | 0 | 0.0 | - | - |
| Spur Park | 8000 | 6/01 | 60 | 26.8 | 1.2 | 19.5 |
| Spur Park Pillow | 8000 | 6/01 | SP | 26.9 | 0.2 | - |

UPPER YELLOWSTONE RIVER

| | | | | | | |
|---------------------------|------|------|----|------|------|------|
| Camp Senia | 7890 | 6/02 | 22 | 9.1 | 0.0 | 5.6 |
| Cooke Station | 8150 | 5/28 | 36 | 17.3 | 0.0 | - |
| Fisher Creek | 9100 | 5/28 | 83 | 40.2 | 24.5 | - |
| Fisher Creek Pillow | 9100 | 5/28 | SP | 38.0 | 19.2 | - |
| Grizzly Peak | 8400 | 6/01 | 75 | 30.4 | - | - |
| Independence | 7850 | 6/03 | 13 | 5.6 | - | - |
| Monument Peak | 8800 | 6/03 | 40 | 20.0 | - | - |
| Northeast Entrance | 7400 | 5/28 | 2 | 1.2 | 0.0 | - |
| Northeast Entrance Pillow | 7350 | 5/28 | SP | 0.1 | 0.0 | - |
| Sacajawea | 6550 | 5/27 | 19 | 8.8 | - | - |
| Timberline Creek | 8850 | 6/02 | 54 | 21.1 | 0.0 | 13.5 |
| White Mill | 8700 | 5/28 | 59 | 28.7 | 13.5 | - |

SP - Snow pillow observation - water content only.



SNOW

| DRAINAGE BASIN and/or SNOW COURSE | | THIS YEAR | | | PAST RECORD | |
|-----------------------------------|-----------|----------------|---------------------|------------------------|------------------------|---------|
| | | Date of Survey | Snow Depth (Inches) | Water Content (Inches) | Water Content (inches) | |
| NAME | Elevation | | | | Last Year | Average |

SUPPLEMENTAL MEASUREMENTS AND CORRECTIONS TO PREVIOUSLY PUBLISHED 1970 DATA

January 1

Kootenai River

| | | | | | | |
|-------------------|------|------|----|-----|------|---|
| Banfield Mountain | 5600 | 1/13 | 30 | 7.0 | 16.5 | - |
| Bristow Creek | 3900 | 1/13 | 22 | 4.8 | 9.9 | - |
| Lost Soul | 4800 | 1/13 | 27 | 5.8 | 11.1 | - |

Madison River

| | | | | | | |
|-----------------|------|-----|----|-----|---|---|
| Madison Plateau | 7750 | 1/7 | 35 | 9.1 | - | - |
|-----------------|------|-----|----|-----|---|---|

Gallatin River

| | | | | | | |
|--------------|------|------|----|------|------|---|
| Carrot Basin | 9000 | 1/12 | 52 | 14.9 | 19.7 | - |
|--------------|------|------|----|------|------|---|

Judith River

| | | | | | | |
|-----------|------|-----|----|------|------|---|
| Spur Park | 8000 | 1/8 | 42 | 11.4 | 10.4 | - |
|-----------|------|-----|----|------|------|---|

Milk River

| | | | | | | |
|-------------------|------|-----|----|-----|-----|---|
| Bear Paw Ski Area | 5200 | 1/7 | 19 | 4.2 | - | - |
| Rocky Boy | 4700 | 1/7 | 13 | 2.1 | 1.1 | - |

Upper Yellowstone River

| | | | | | | |
|---------------|------|------|----|------|---|---|
| Cooke Station | 8150 | 1/14 | 41 | 9.2 | - | - |
| Fisher Creek | 9100 | 1/14 | 70 | 17.8 | - | - |
| White Mill | 8700 | 1/14 | 55 | 13.4 | - | - |

February 1

Gallatin River

| | | | | | | |
|-----------------|------|------|-----------|------|------|------|
| Twenty-One Mile | 7150 | 2/04 | <u>47</u> | 11.4 | 21.8 | 11.9 |
|-----------------|------|------|-----------|------|------|------|

Upper Yellowstone River

| | | | | | | |
|--------------------|------|------|-----------|------------|-----|-----|
| Northeast Entrance | 7400 | 2/01 | <u>35</u> | <u>8.4</u> | 8.6 | 6.0 |
|--------------------|------|------|-----------|------------|-----|-----|

March 1

Kootenai River

| | | | | | | |
|--------------|------|------|-----|-------------|------|------|
| Baree Creek | 5500 | 3/01 | 105 | <u>37.6</u> | 47.6 | 43.5 |
| Baree Midway | 4600 | 3/01 | 94 | <u>31.3</u> | 35.9 | - |

Flathead River

| | | | | | | |
|-----------------------|------|------|-----|------|------|------|
| Beaver Lake | 5900 | 3/10 | 67 | 22.4 | 23.2 | 20.0 |
| Gunsight Lake | 6300 | 3/10 | 102 | 38.0 | 38.6 | 36.0 |
| Spotted Bear Mountain | 7000 | 3/10 | 49 | 17.2 | 14.4 | 13.6 |
| Trinkus Lake | 6100 | 3/10 | 121 | 44.2 | 41.5 | 37.0 |
| Twin Creeks | 3580 | 3/10 | 40 | 13.7 | 14.2 | 11.3 |
| Upper Holland Lake | 6200 | 3/10 | 91 | 32.2 | 35.6 | 30.4 |



SNOW

| DRAINAGE BASIN and/or SNOW COURSE | | THIS YEAR | | | PAST RECORD | |
|-----------------------------------|-----------|----------------|---------------------|------------------------|------------------------|---------|
| | | Date of Survey | Snow Depth (Inches) | Water Content (Inches) | Water Content (inches) | |
| NAME | Elevation | | | | Last Year | Average |

SUPPLEMENTAL MEASUREMENTS AND CORRECTIONS (Continued)

March 1
Clark Fork River

| | | | | | | |
|-----------------------|------|------|-----------|------------|-----|-----|
| Lubrecht Forest No. 3 | 5450 | 3/02 | <u>25</u> | <u>5.7</u> | 9.6 | 6.6 |
|-----------------------|------|------|-----------|------------|-----|-----|

Bitterroot River

| | | | | | | |
|--------------|------|------|----|-------------|------|------|
| Gibbons Pass | 7100 | 2/24 | 54 | <u>18.8</u> | 26.9 | 19.5 |
|--------------|------|------|----|-------------|------|------|

Madison River

| | | | | | | |
|---------------|------|------|-----------|------|------|---|
| Lion Mountain | 8760 | 2/25 | <u>50</u> | 13.5 | 27.8 | - |
|---------------|------|------|-----------|------|------|---|

Sun-Teton-Marias Rivers

| | | | | | | |
|---------------|------|------|-----|------|------|------|
| Badger Pass | 6900 | 3/10 | 100 | 35.5 | 38.9 | 31.8 |
| Blue Lake | 5900 | 3/10 | 65 | 23.4 | 28.9 | - |
| Five Bull | 5700 | 3/10 | 27 | 7.0 | 9.3 | 5.7 |
| Freight Creek | 6000 | 3/10 | 38 | 11.5 | 14.2 | 14.1 |
| Wrong Creek | 5700 | 2/28 | 39 | 10.8 | 13.5 | 14.3 |

April 1
Flathead River

| | | | | | | |
|---------------|------|------|----|-------------|------|------|
| Marias Pass | 5250 | 3/26 | 67 | <u>20.2</u> | 17.0 | 18.8 |
| Mineral Creek | 4000 | 4/01 | 58 | <u>19.2</u> | 19.7 | 21.4 |

Clark Fork River

| | | | | | | |
|-------------|------|------|----|-------------|------|------|
| Cotter Mine | 6250 | 4/06 | 51 | <u>20.6</u> | 21.8 | 17.2 |
|-------------|------|------|----|-------------|------|------|

Beaverhead River

| | | | | | | |
|------------------|------|------|----|-------|------|------|
| Dad Creek Lake | 8400 | 4/01 | 53 | 15.3E | 17.6 | 13.0 |
| White Pine Ridge | 8850 | 4/01 | 22 | 5.6E | 5.8 | 5.2 |

Ruby River

| | | | | | | |
|---------------|------|------|----|-------|------|------|
| Clover Meadow | 8600 | 4/01 | 68 | 21.1E | 19.7 | 16.0 |
| Divide | 7900 | 4/01 | 42 | 11.9E | 16.2 | 9.7 |
| Notch | 8500 | 4/01 | 68 | 20.3E | 19.6 | 13.6 |

Big Hole River

| | | | | | | |
|------------------|------|------|----|-------|------|------|
| Abundance Lake | 8800 | 4/01 | 72 | 23.0E | 14.4 | 19.8 |
| Darkhorse Lake | 8600 | 4/01 | 89 | 29.5E | 30.6 | 27.0 |
| Foolhen | 8280 | 4/01 | 60 | 18.5E | 20.1 | 17.8 |
| Slag-A-Melt Lake | 8750 | 4/01 | 92 | 30.4E | 29.8 | - |

Madison River

| | | | | | | |
|-----------|------|------|----|-------|------|------|
| Call Road | 8050 | 4/01 | 51 | 14.7E | 10.9 | 10.8 |
|-----------|------|------|----|-------|------|------|

Sun-Teton-Marias Rivers

| | | | | | | |
|---------------|------|------|----|-------------|------|------|
| Goat Mountain | 7000 | 4/05 | 36 | <u>11.0</u> | 13.4 | 11.7 |
|---------------|------|------|----|-------------|------|------|



SNOW

| DRAINAGE BASIN and/or SNOW COURSE | | THIS YEAR | | | PAST RECORD | |
|-----------------------------------|-----------|----------------|---------------------|------------------------|------------------------|---------|
| | | Date of Survey | Snow Depth (Inches) | Water Content (Inches) | Water Content (inches) | |
| NAME | Elevation | | | | Last Year | Average |

SUPPLEMENTAL MEASUREMENTS AND CORRECTIONS (Continued)

May 1
Beaverhead River

| | | | | | | |
|-----------------|------|------|----|------|------|------|
| Lakeview Canyon | 6930 | 5/05 | 36 | 11.7 | 20.4 | 10.7 |
| Lakeview Ridge | 7400 | 5/05 | 32 | 10.3 | 12.5 | 9.0 |

Missouri River (Main Stem)

| | | | | | | |
|--------------|------|------|----|------|-----|------|
| Stemple Pass | 6600 | 5/01 | 50 | 12.3 | 6.8 | 10.8 |
|--------------|------|------|----|------|-----|------|

Upper Yellowstone River

| | | | | | | |
|--------------------|------|------|----|-------|------|------|
| Cooke Station | 8150 | 4/30 | 76 | 27.7E | 18.8 | - |
| South Fork Shields | 8100 | 5/04 | 97 | 37.4 | 20.2 | 27.2 |

May 15
Clark Fork River

| | | | | | | |
|-------------|------|------|----|------|---|---|
| Intergaard | 6450 | 5/15 | 30 | 9.4 | - | - |
| TV Mountain | 6800 | 5/14 | 75 | 25.1 | - | - |

Ruby River

| | | | | | | |
|---------------|------|------|----|------|---|---|
| Smuggler Mine | 6960 | 5/17 | 29 | 11.0 | - | - |
|---------------|------|------|----|------|---|---|

Jefferson River

| | | | | | | |
|-----------------|------|------|----|-----|---|---|
| Nez Perce Creek | 6500 | 5/14 | 19 | 8.1 | - | - |
|-----------------|------|------|----|-----|---|---|

Missouri River (Main Stem)

| | | | | | | |
|----------|------|------|----|------|---|---|
| Elk Peak | 8000 | 5/13 | 76 | 28.6 | - | - |
|----------|------|------|----|------|---|---|

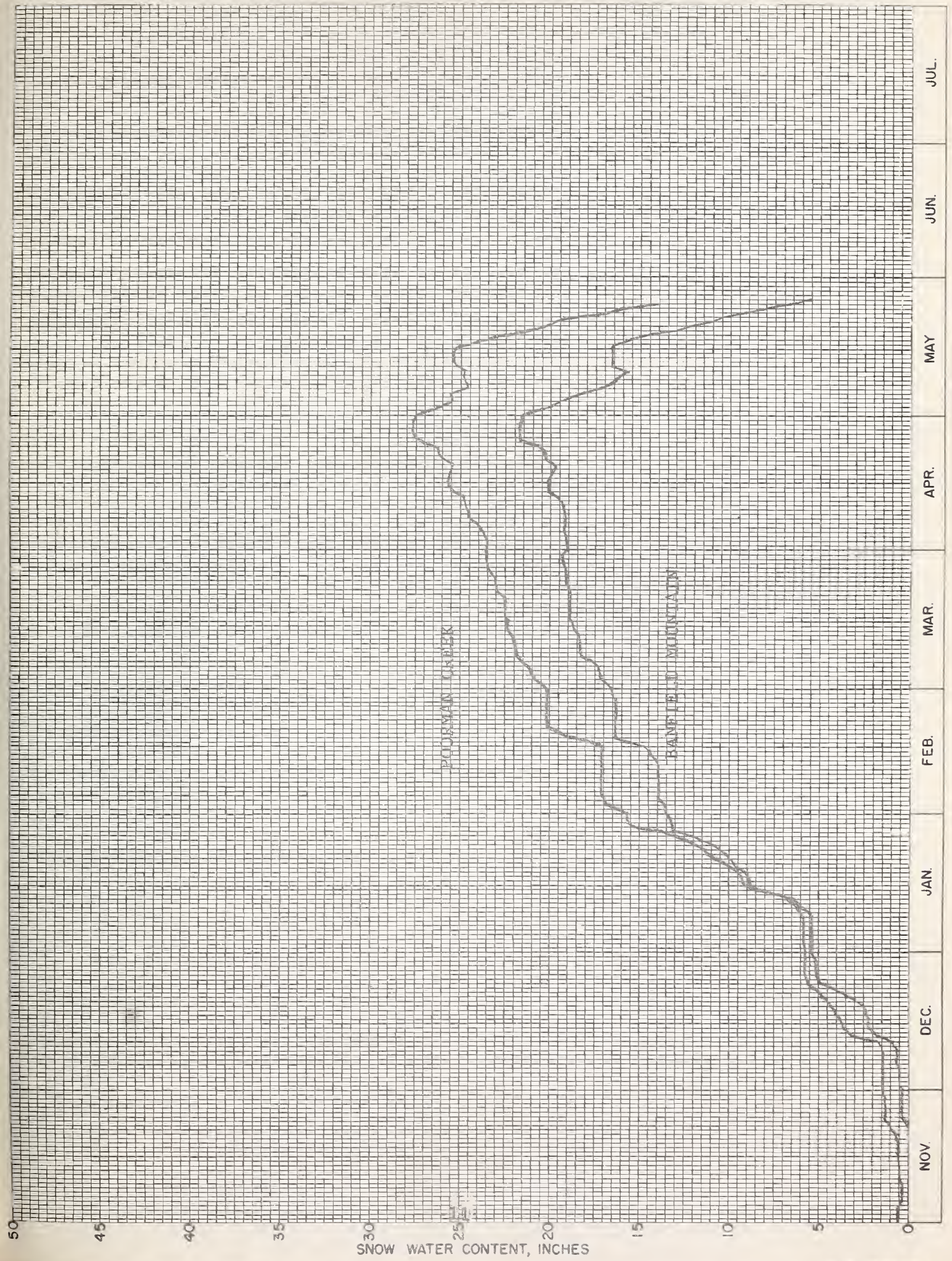
E - Estimated data.

TABLE

| No. | | Description | | Amount | |
|-----|--|-------------|--|--------|--|
| 1 | | Jan 1 | | | |
| 2 | | Feb 1 | | | |
| 3 | | Mar 1 | | | |
| 4 | | Apr 1 | | | |
| 5 | | May 1 | | | |
| 6 | | Jun 1 | | | |
| 7 | | Jul 1 | | | |
| 8 | | Aug 1 | | | |
| 9 | | Sep 1 | | | |
| 10 | | Oct 1 | | | |
| 11 | | Nov 1 | | | |
| 12 | | Dec 1 | | | |
| 13 | | Jan 1 | | | |
| 14 | | Feb 1 | | | |
| 15 | | Mar 1 | | | |
| 16 | | Apr 1 | | | |
| 17 | | May 1 | | | |
| 18 | | Jun 1 | | | |
| 19 | | Jul 1 | | | |
| 20 | | Aug 1 | | | |
| 21 | | Sep 1 | | | |
| 22 | | Oct 1 | | | |
| 23 | | Nov 1 | | | |
| 24 | | Dec 1 | | | |
| 25 | | Jan 1 | | | |
| 26 | | Feb 1 | | | |
| 27 | | Mar 1 | | | |
| 28 | | Apr 1 | | | |
| 29 | | May 1 | | | |
| 30 | | Jun 1 | | | |
| 31 | | Jul 1 | | | |
| 32 | | Aug 1 | | | |
| 33 | | Sep 1 | | | |
| 34 | | Oct 1 | | | |
| 35 | | Nov 1 | | | |
| 36 | | Dec 1 | | | |
| 37 | | Jan 1 | | | |
| 38 | | Feb 1 | | | |
| 39 | | Mar 1 | | | |
| 40 | | Apr 1 | | | |
| 41 | | May 1 | | | |
| 42 | | Jun 1 | | | |
| 43 | | Jul 1 | | | |
| 44 | | Aug 1 | | | |
| 45 | | Sep 1 | | | |
| 46 | | Oct 1 | | | |
| 47 | | Nov 1 | | | |
| 48 | | Dec 1 | | | |
| 49 | | Jan 1 | | | |
| 50 | | Feb 1 | | | |
| 51 | | Mar 1 | | | |
| 52 | | Apr 1 | | | |
| 53 | | May 1 | | | |
| 54 | | Jun 1 | | | |
| 55 | | Jul 1 | | | |
| 56 | | Aug 1 | | | |
| 57 | | Sep 1 | | | |
| 58 | | Oct 1 | | | |
| 59 | | Nov 1 | | | |
| 60 | | Dec 1 | | | |
| 61 | | Jan 1 | | | |
| 62 | | Feb 1 | | | |
| 63 | | Mar 1 | | | |
| 64 | | Apr 1 | | | |
| 65 | | May 1 | | | |
| 66 | | Jun 1 | | | |
| 67 | | Jul 1 | | | |
| 68 | | Aug 1 | | | |
| 69 | | Sep 1 | | | |
| 70 | | Oct 1 | | | |
| 71 | | Nov 1 | | | |
| 72 | | Dec 1 | | | |
| 73 | | Jan 1 | | | |
| 74 | | Feb 1 | | | |
| 75 | | Mar 1 | | | |
| 76 | | Apr 1 | | | |
| 77 | | May 1 | | | |
| 78 | | Jun 1 | | | |
| 79 | | Jul 1 | | | |
| 80 | | Aug 1 | | | |
| 81 | | Sep 1 | | | |
| 82 | | Oct 1 | | | |
| 83 | | Nov 1 | | | |
| 84 | | Dec 1 | | | |
| 85 | | Jan 1 | | | |
| 86 | | Feb 1 | | | |
| 87 | | Mar 1 | | | |
| 88 | | Apr 1 | | | |
| 89 | | May 1 | | | |
| 90 | | Jun 1 | | | |
| 91 | | Jul 1 | | | |
| 92 | | Aug 1 | | | |
| 93 | | Sep 1 | | | |
| 94 | | Oct 1 | | | |
| 95 | | Nov 1 | | | |
| 96 | | Dec 1 | | | |
| 97 | | Jan 1 | | | |
| 98 | | Feb 1 | | | |
| 99 | | Mar 1 | | | |
| 100 | | Apr 1 | | | |

SNOW PILLOW DATA
WATER YEAR 1970

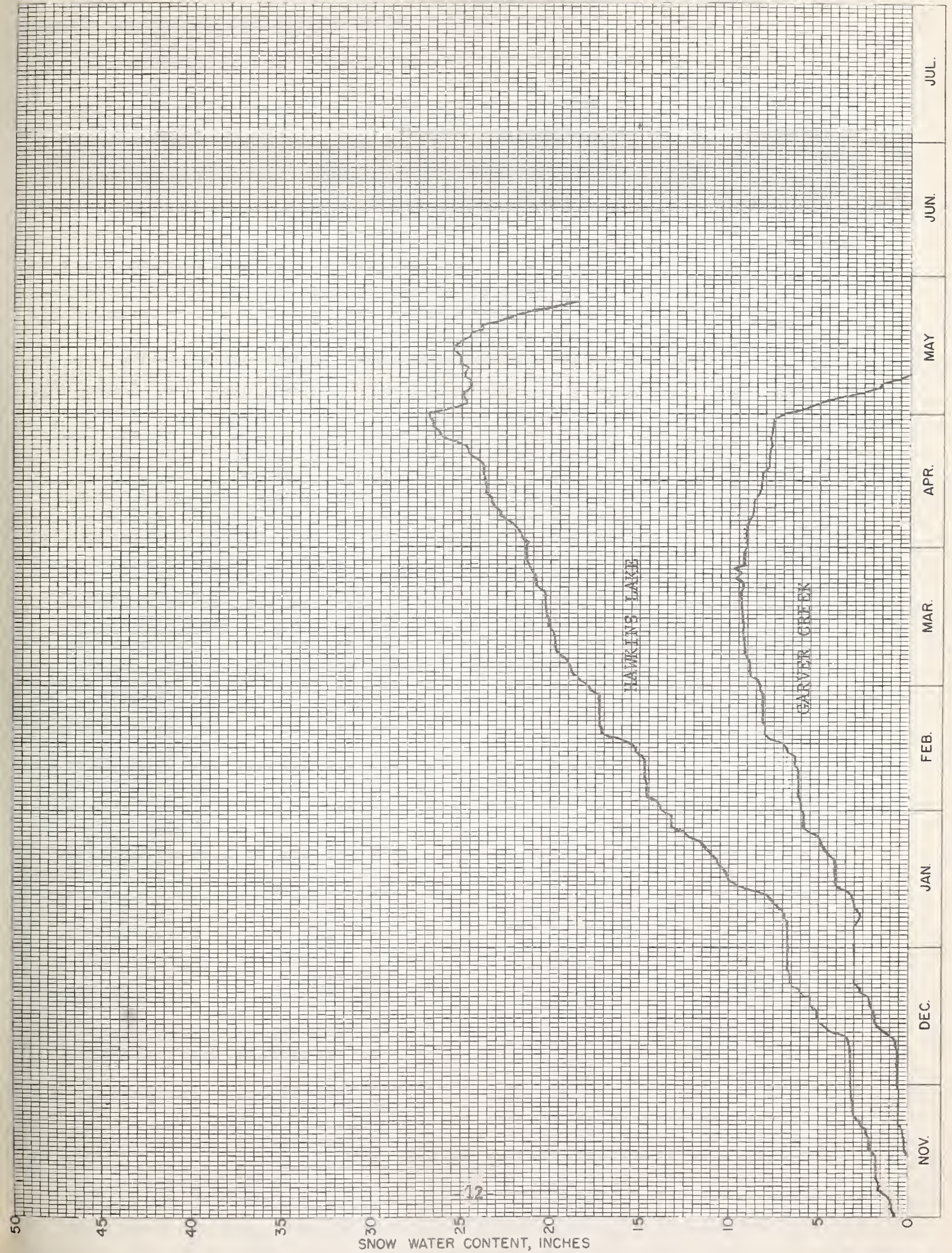
No. _____ Elev. _____ Drainage: KOOTENAI





SNOW PILLOW DATA
WATER YEAR 1970

No. _____ Elev. _____ Drainage: KOOTENAI

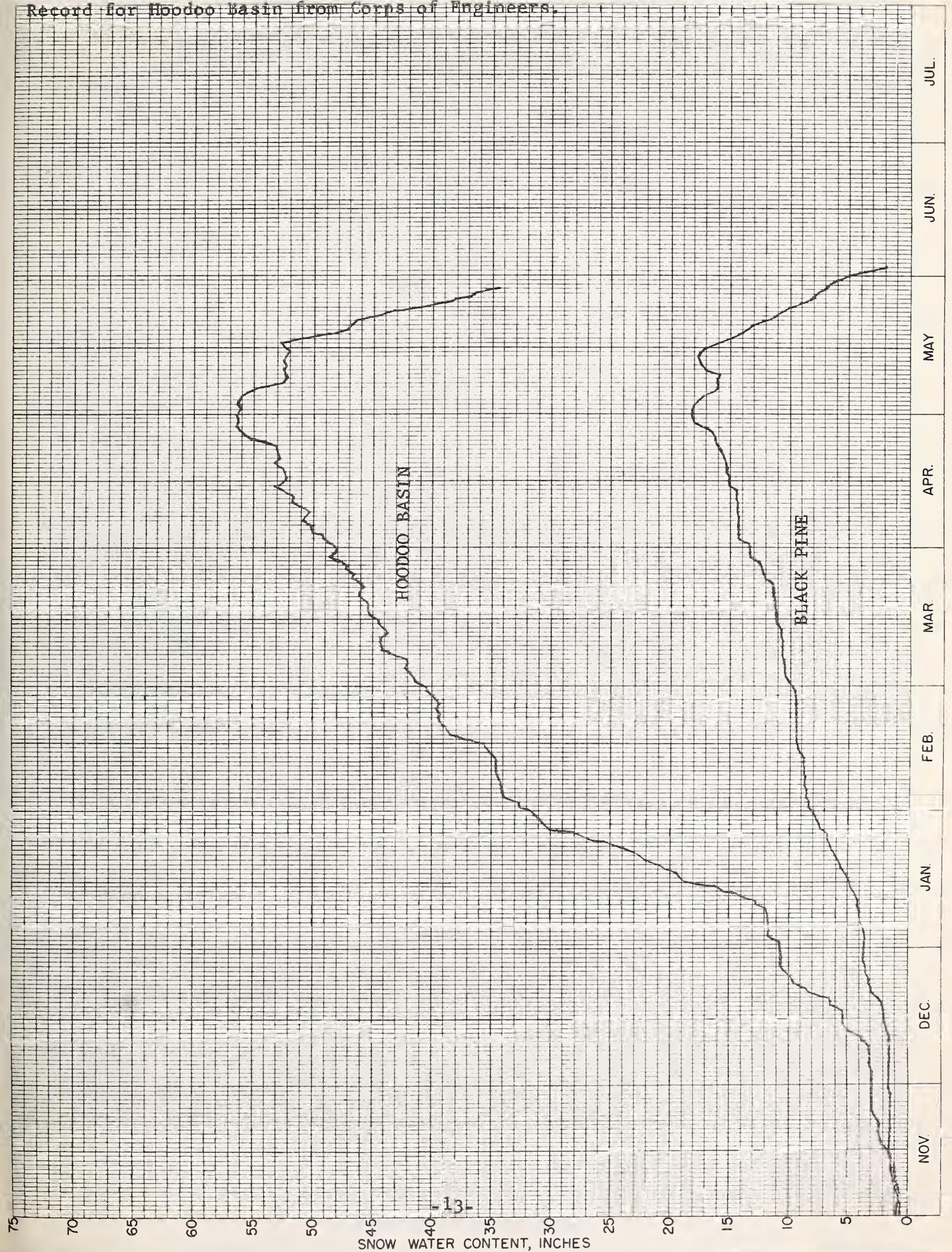




SNOW PILLOW DATA
WATER YEAR 1970

No. _____ Elev. _____ Drainage: CLARK FORK

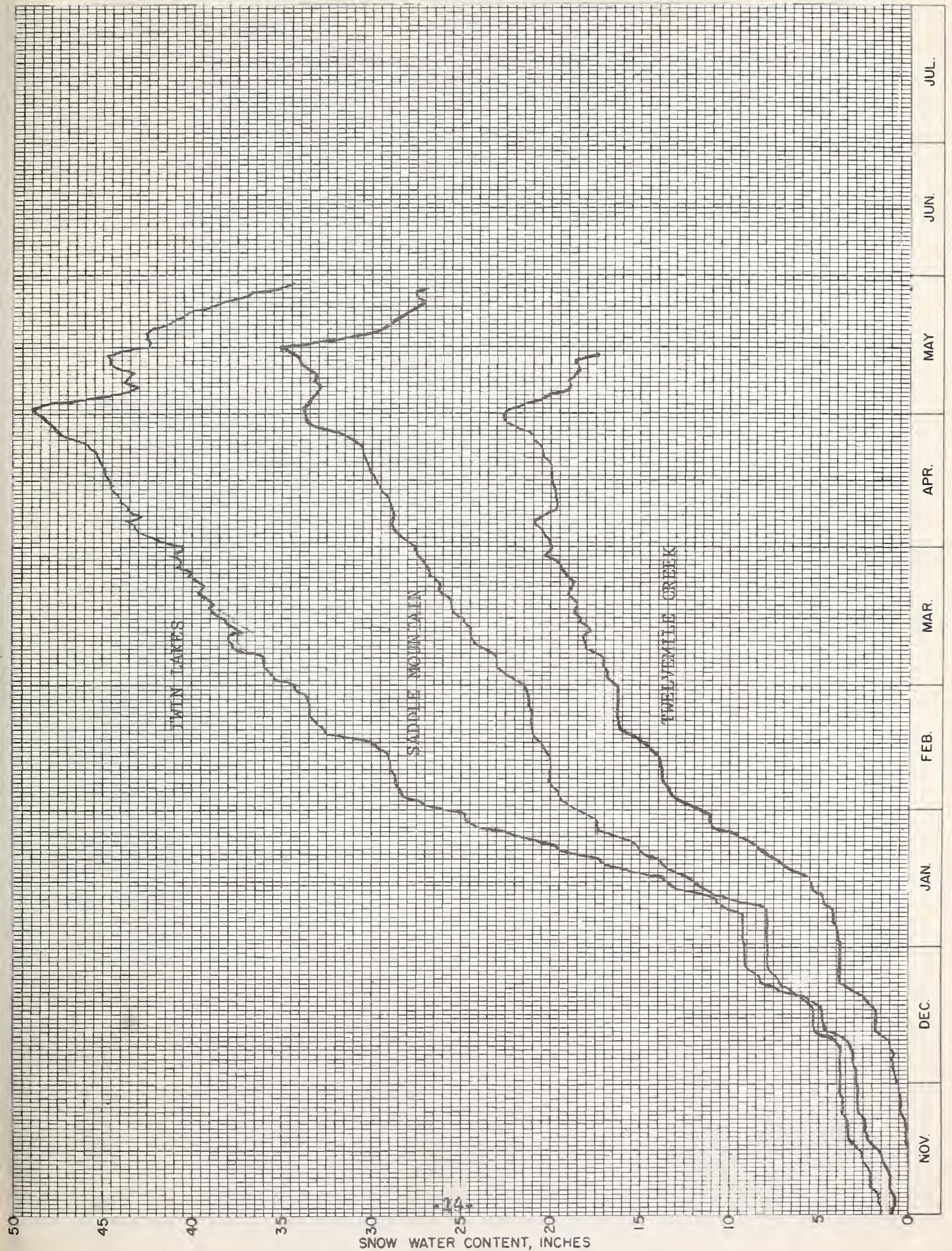
Record for Hoodoo Basin from Corps of Engineers.





SNOW PILLOW DATA WATER YEAR 1970

No. _____ Elev. _____ Drainage: BITTERROOT

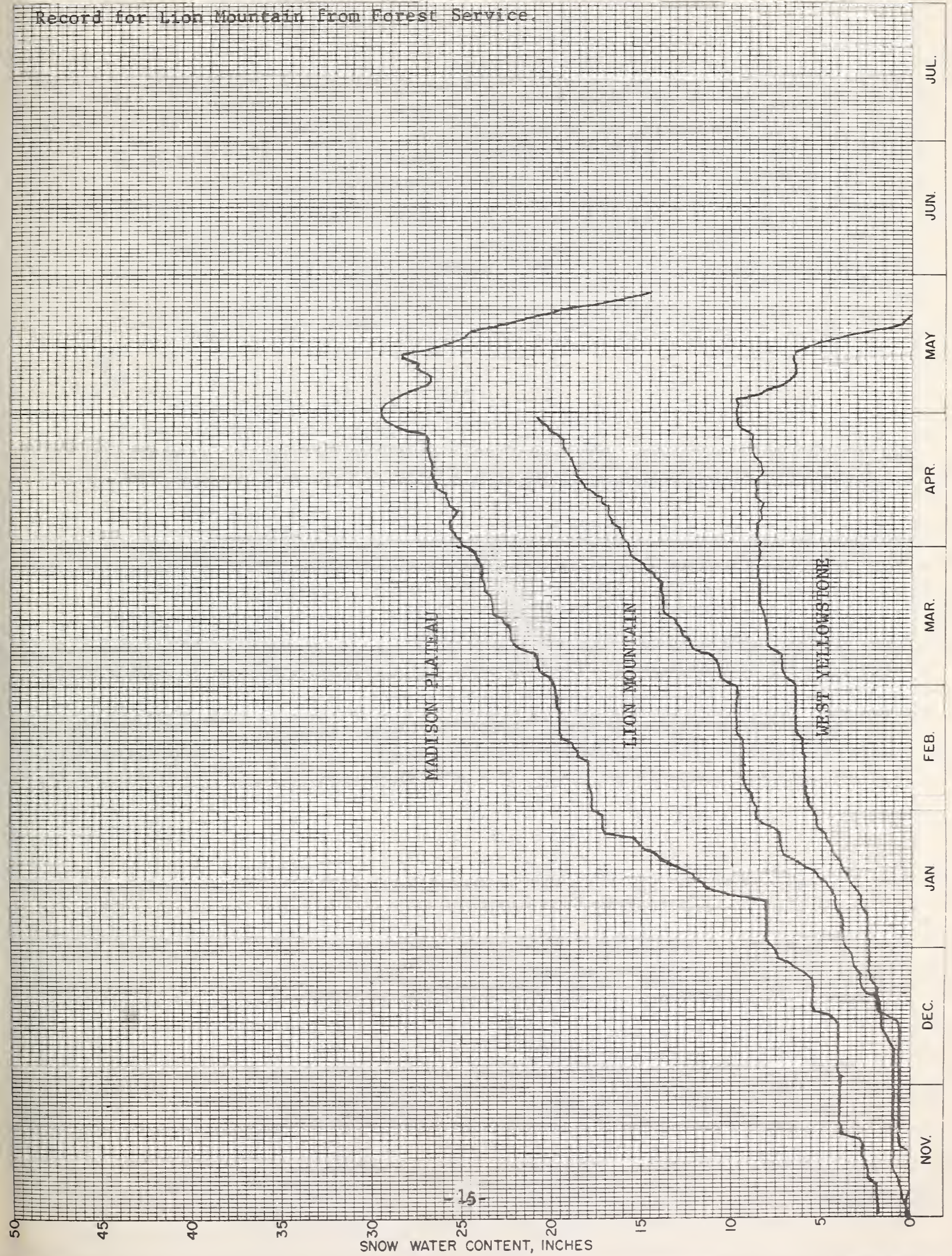




SNOW PILLOW DATA
WATER YEAR 1970

No. _____ Elev. _____ Drainage: MADISON

Record for Lion Mountain from Forest Service.

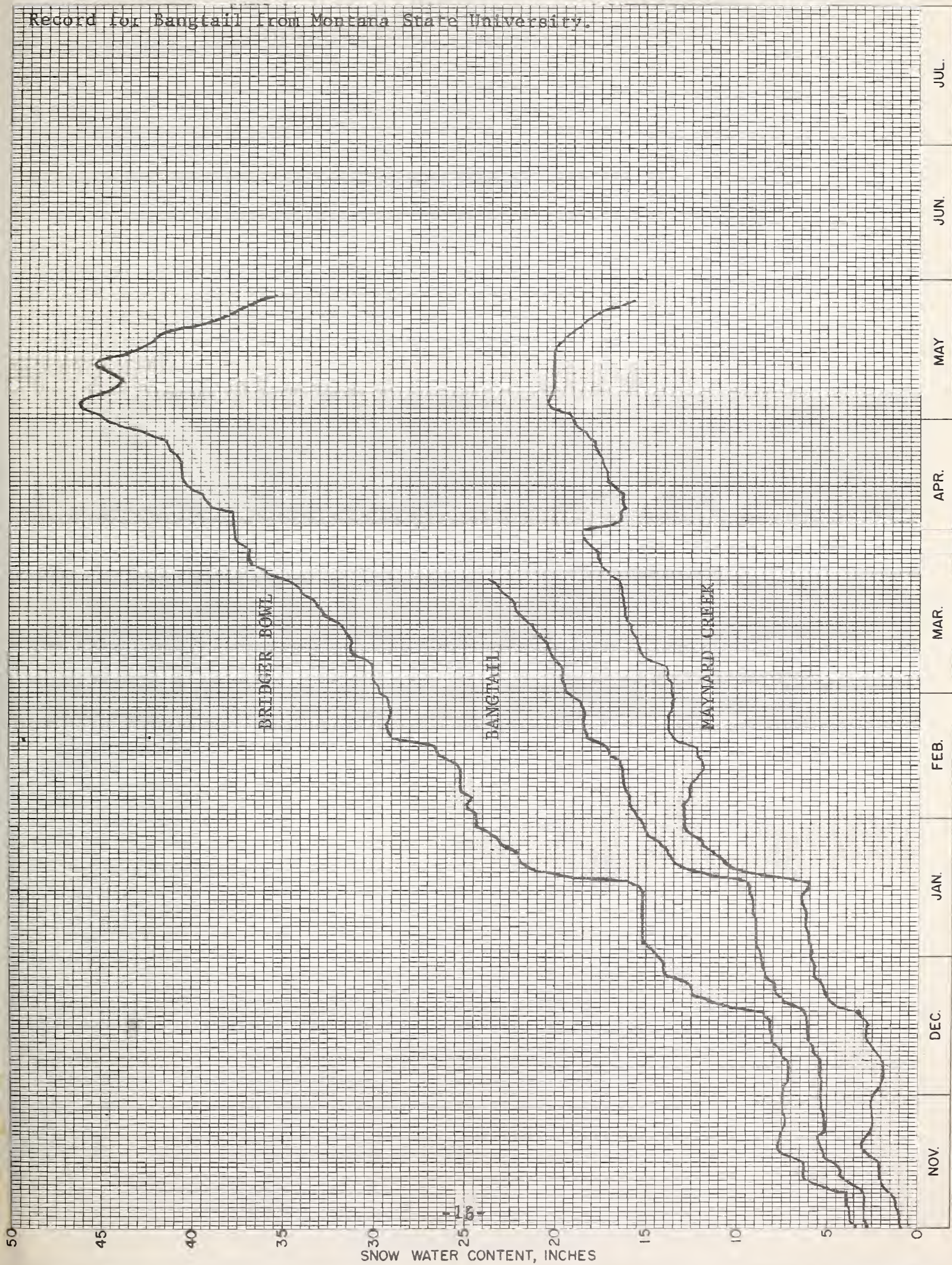




SNOW: PILLOW DATA
WATER YEAR 1970

No. _____ Elev. _____ Drainage: GALLATIN

Record for Bangtail from Montana State University.

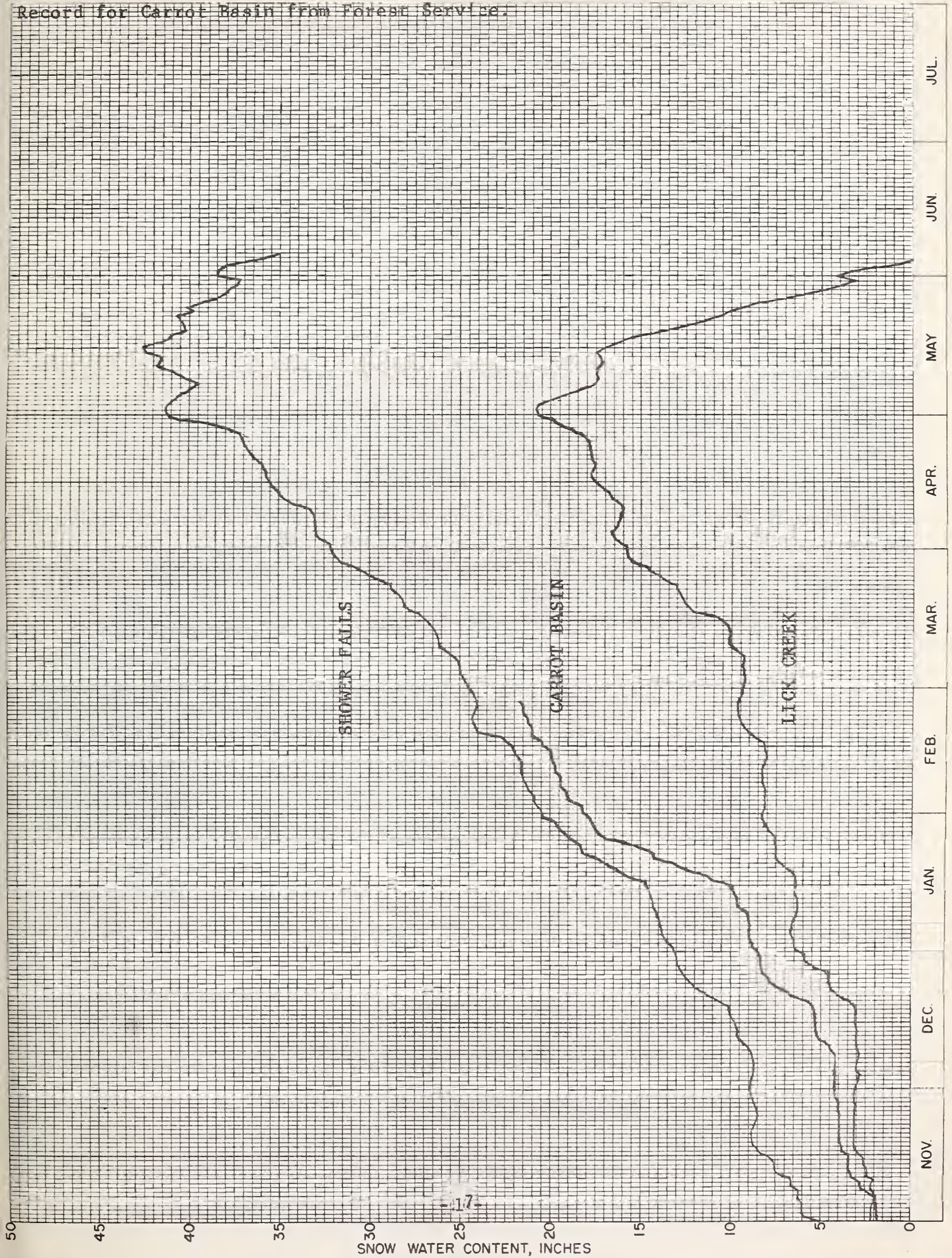


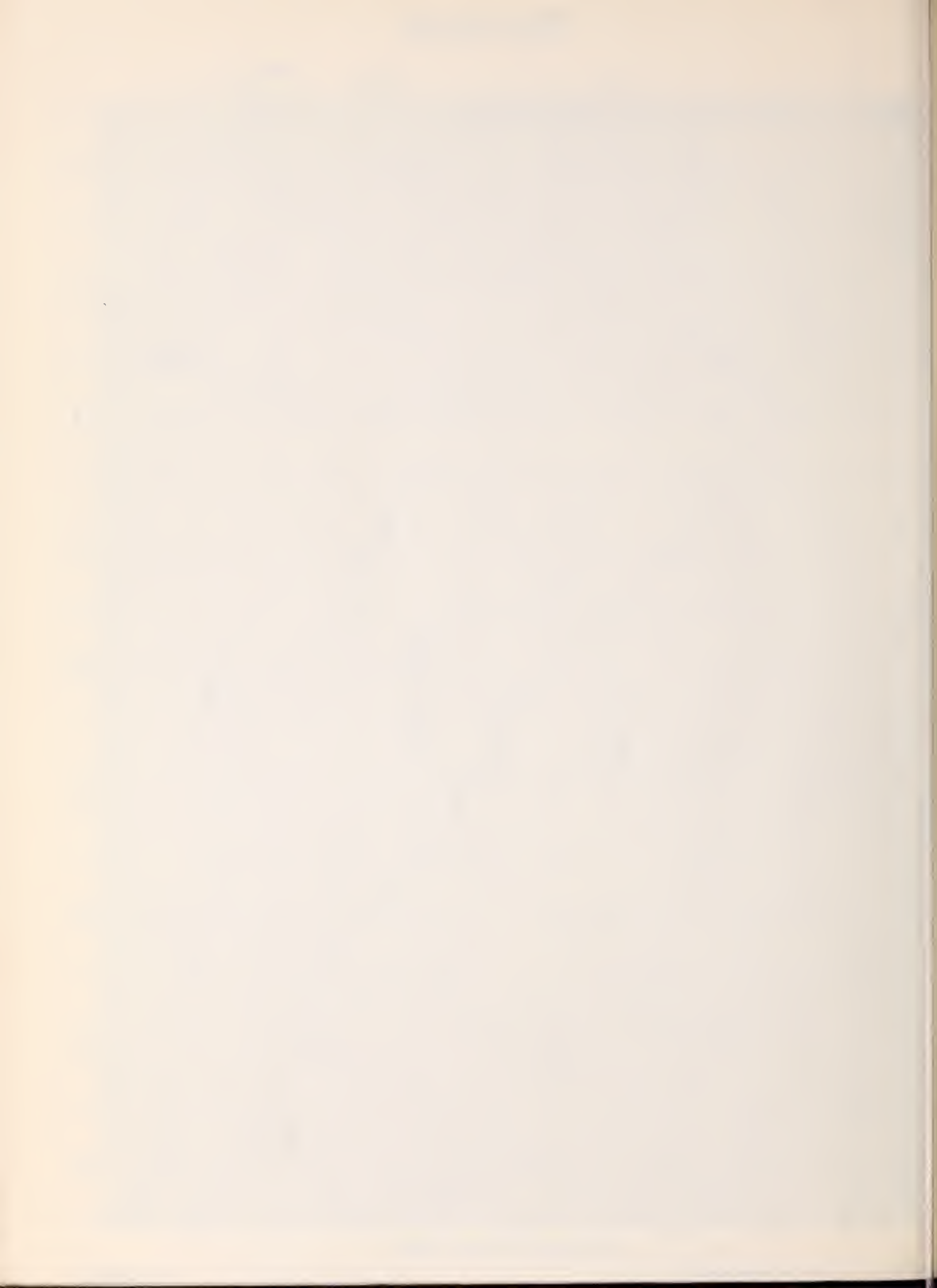


SNOW PILLOW DATA
WATER YEAR 1970

No. _____ Elev. _____ Drainage: GALLATIN

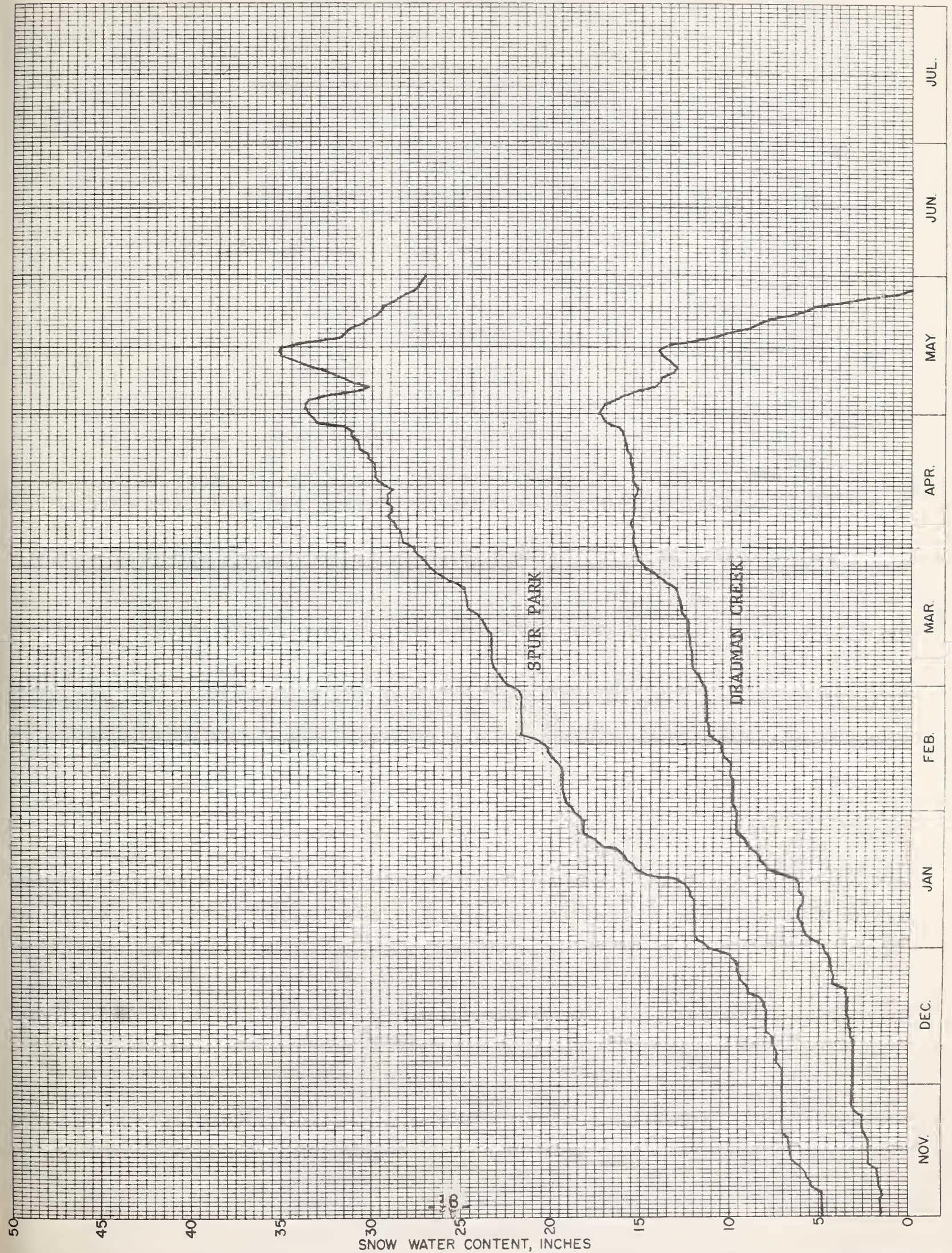
Record for Carrot Basin from Forest Service.





SNOW PILLOW DATA
WATER YEAR 1970

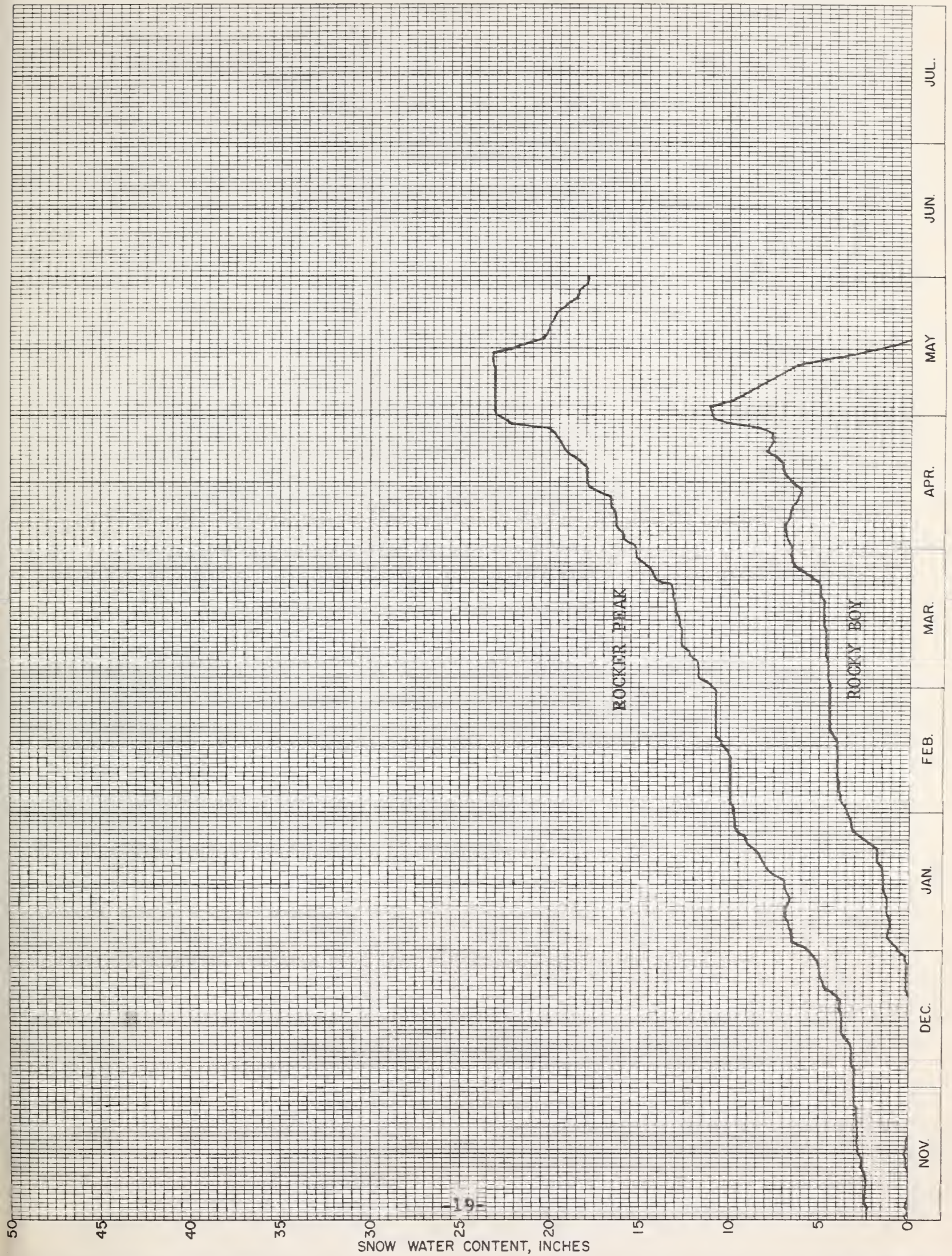
No. _____ Elev. _____ Drainage: JUDITH-JEFFERSON-MISSOURI





SNOW PILLOW DATA
WATER YEAR 1970

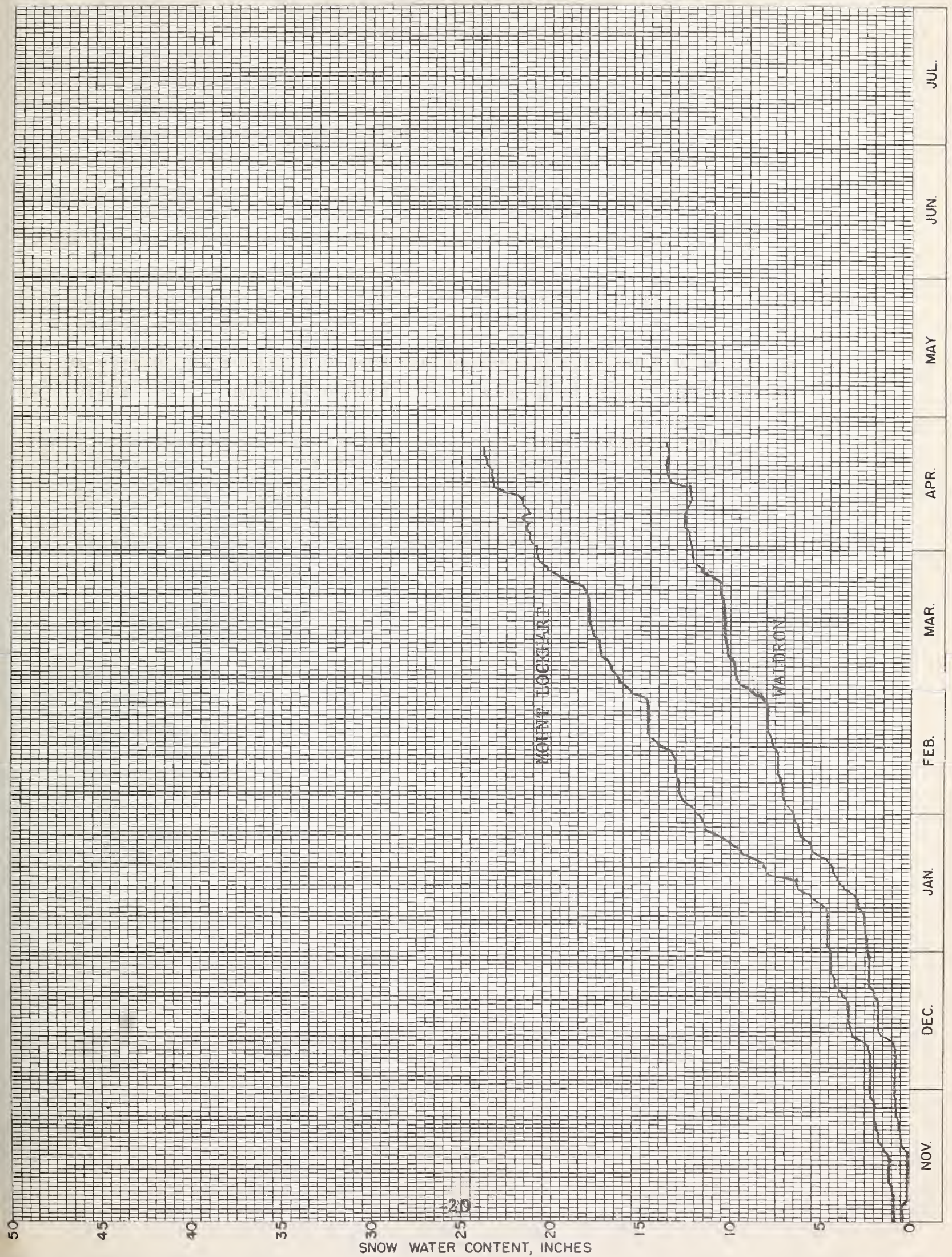
No. _____ Elev. _____ Drainage: JUDITH-JEFFERSON-MISSOURI





SNOW PILLOW DATA
WATER YEAR 1970

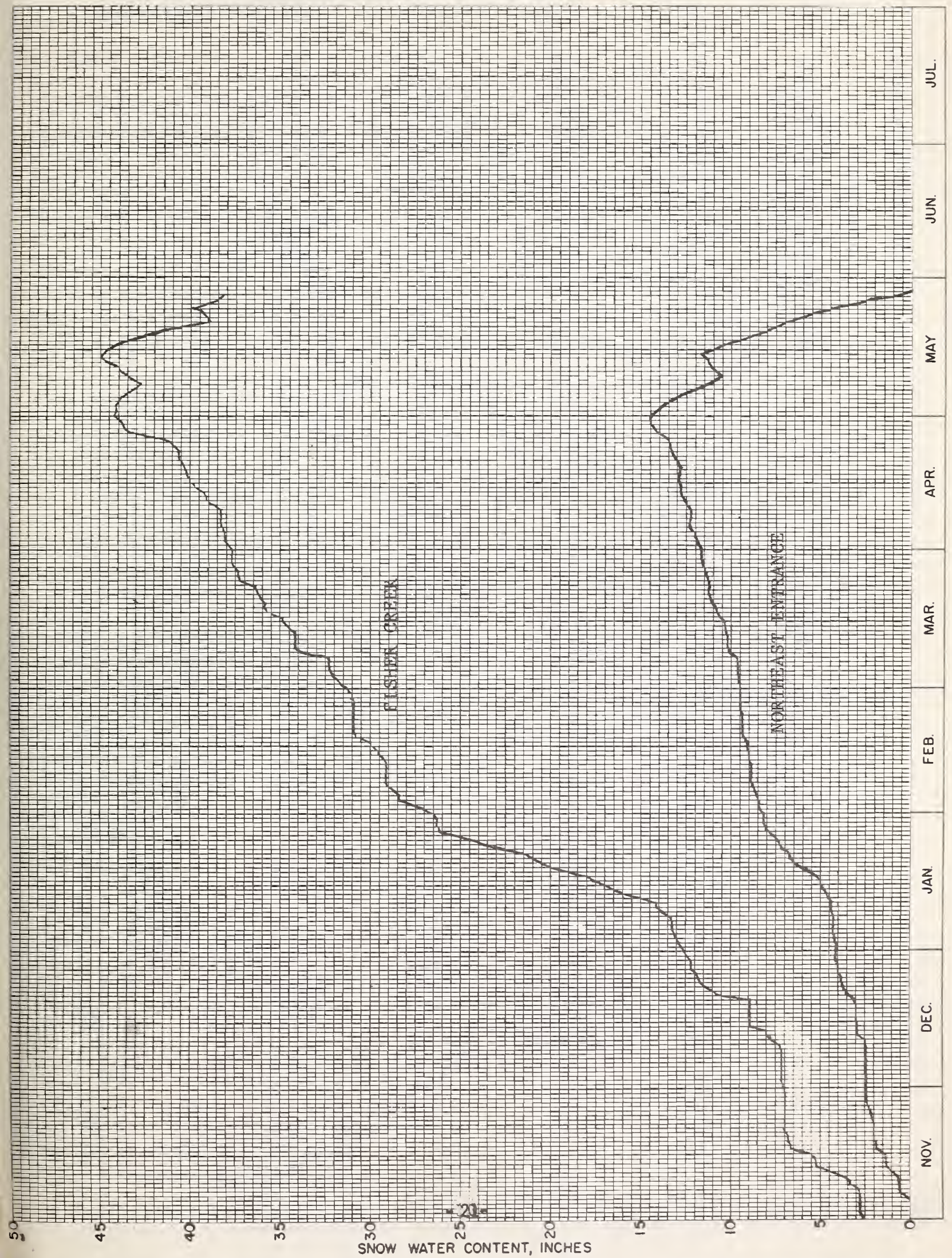
No. _____ Elev. _____ Drainage: SUN



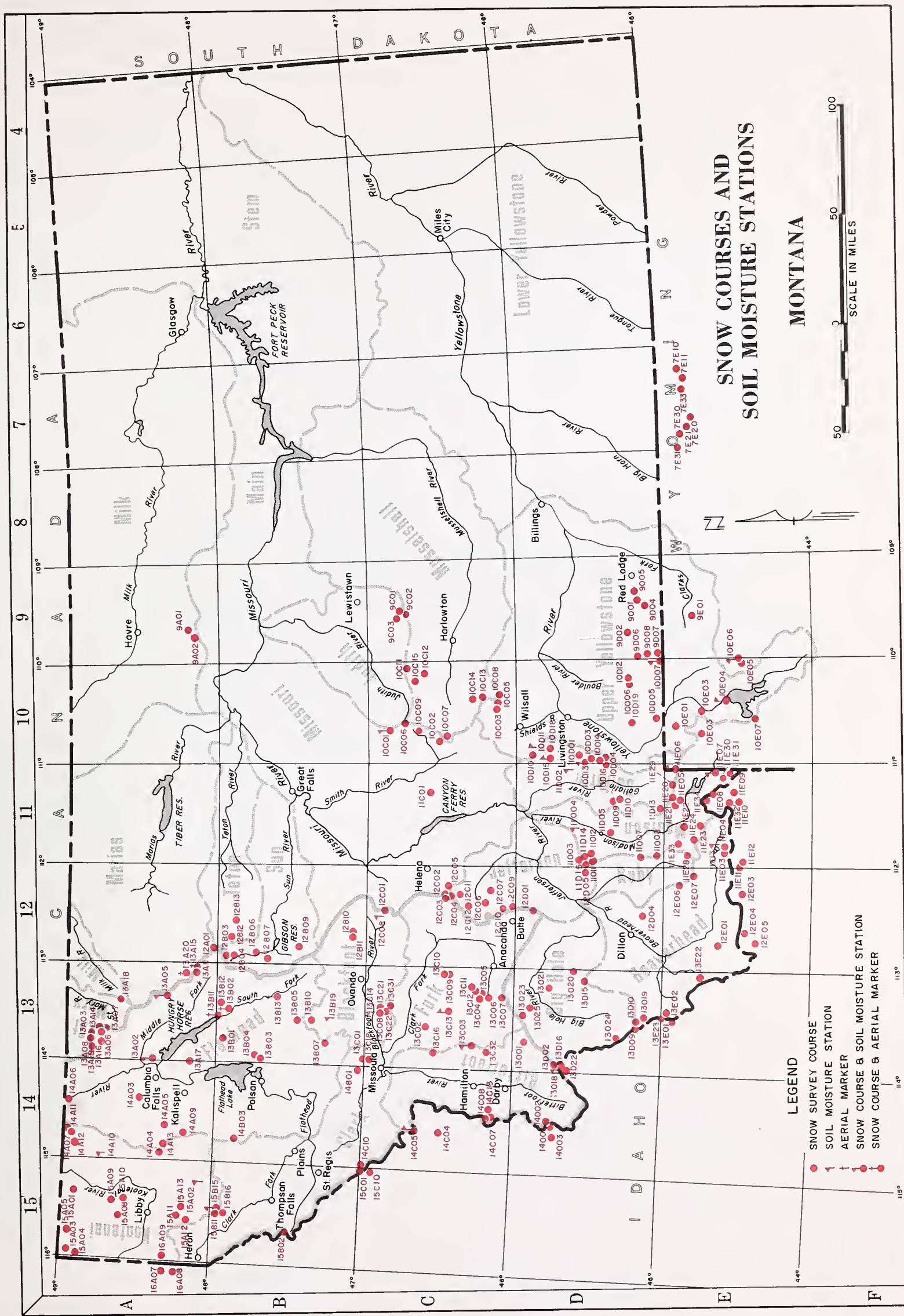


SNOW PILLOW DATA
WATER YEAR 1970

No. _____ Elev. _____ Drainage: YELLOWSTONE







SNOW COURSES AND SOIL MOISTURE STATIONS

MONTANA



LEGEND

- SNOW SURVEY COURSE
- ✕ SOIL MOISTURE STATION
- ✕⊥ AERIAL MARKER
- ✕⊥ SNOW COURSE & SOIL MOISTURE STATION

Agencies and Organizations Cooperating in Montana Snow Surveys

U. S. Forest Service
Region I, Missoula, Montana
Montana Forests and Ranger
Districts

U. S. Geological Survey
Helena, Montana
Portland, Oregon

U. S. Army Corps of Engineers
Portland, Oregon
Seattle, Washington
Walla Walla, Washington
Omaha, Nebraska

U. S. Indian Irrigation Service
St. Ignatius, Montana

U. S. Weather Bureau
Helena, Montana
Portland, Oregon
Kansas City, Missouri

U. S. Bureau of Sports Fisheries
and Wildlife
Red Rock Lakes Refuge
Monida, Montana

U. S. Bureau of Reclamation
Billings, Montana
Boise, Idaho

U. S. Bonneville Power Administration
Portland, Oregon

U. S. Soil Conservation Service
Montana, Wyoming, Idaho

Soil and Water Conservation Districts
Montana Counties

U. S. National Park Service
Yellowstone National Park
Glacier National Park

Montana Power Company
Butte, Montana

Montana Water Resources Board
Helena, Montana

North Montana Branch Station
Agricultural Experiment Station
Havre, Montana

Montana State University
Agricultural Experiment Station
Bozeman, Montana

University of Montana
School of Forestry
Missoula, Montana

Water Rights Branch, Dept. of
Lands and Forests
Victoria, British Columbia

Department of Energy, Mines and
Resources
Calgary, Alberta

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

P. O. Box 98
BOZEMAN, MONTANA 59715

OFFICIAL BUSINESS



POSTAGE AND FEES PAID
U. S. DEPARTMENT OF AGRICULTURE

FIRST CLASS MAIL

USDA - NATIONAL AGRICULTURAL LIBRARY
CURRENT SERIAL RECORD
BELTSVILLE, MD. 20705

USDA - NATIONAL AGRICULTURAL LIBRARY
CURRENT SERIAL RECORD
BELTSVILLE, MD. 20705

FEDERAL - STATE - PRIVATE
COOPERATIVE SNOW SURVEYS

Furnishes the basic data
necessary for forecasting
water supply for irrigation,
domestic and municipal water
supply, hydro-electric power
generation, navigation,
mining and industry

*"The Conservation of Water begins
with the Snow Survey"*